

WHAT IS CLAIMED IS:

1. A laser light output apparatus comprising:  
a semiconductor laser which has a suitable  
operating temperature;

5 a driving section which supplies a driving current  
to the semiconductor laser;

a temperature sensing section which senses the  
temperature of the semiconductor laser;

an electronic temperature control section which  
10 controls the temperature of the semiconductor laser to  
the suitable operating temperature on the basis of the  
temperature sensed by the temperature sensing section  
in a state where at least the semiconductor laser is  
being driven; and

15 a driving current control section which sets the  
driving current to an initial value smaller than a  
steady value at the suitable operating temperature at  
the start time of the driving of the semiconductor  
laser and changes the driving current to the steady  
20 value as the temperature of the semiconductor laser  
changes to the suitable operating temperature under the  
control of the electronic temperature control section.

2. A laser light output apparatus comprising:

a semiconductor laser which has a suitable  
25 operating temperature;

a driving section which supplies a driving current  
to the semiconductor laser;

a temperature sensing section which senses the temperature of the semiconductor laser;

an electronic temperature control section which controls the temperature of the semiconductor laser to the suitable operating temperature on the basis of the temperature sensed by the temperature sensing section in a state where at least the semiconductor laser is being driven; and

a driving current control section which sets the driving current to an initial value smaller than a steady value at the suitable operating temperature at the start time of the driving of the semiconductor laser and changes the driving current to the steady value as time elapses since the start time of the driving.

3. The laser light output apparatus according to claim 1, wherein the driving current control section determines the initial value according to the temperature sensed by the temperature sensing section at the start time of the driving of the semiconductor laser and changes the driving current according to the temperature sensed by the temperature sensing section.

4. The laser light output apparatus according to claim 1, wherein the initial value is a threshold current which causes the semiconductor laser to start laser oscillation.

5. The laser light output apparatus according to

claim 2, wherein the initial value is a threshold current which causes the semiconductor laser to start laser oscillation.

5       6. The laser light output apparatus according to claim 1, further comprising:

        a displaying section which, when the driving current is smaller than the steady value, displays the state.

10       7. The laser light output apparatus according to claim 2, further comprising:

        a displaying section which, when the driving current is smaller than the steady value, displays the state.

15       8. The laser light output apparatus according to claim 1, further comprising:

        a continuing section which, when the driving of the semiconductor laser is stopped, causes the electronic temperature control section to continue a temperature control operation for a specific duration since the stop time of the driving.

20       9. The laser light output apparatus according to claim 2, further comprising:

        a continuing section which, when the driving of the semiconductor laser is stopped, causes the electronic temperature control section to continue a temperature control operation for a specific duration since the stop time of the driving.

10. An image display apparatus comprising:

a display section;

a light source section which generates and outputs  
a plurality of laser beams differing in wavelength; and

5 a projection section which processes each of said  
plurality of laser beams on the basis of a video signal  
and projects the resulting signal onto the display  
section, wherein

the light source section includes

10 a plurality of laser light output sections which  
generate and output the laser beams separately, and

a balance keeping section which maintains constant  
the intensity balance between the laser beams outputted  
from the laser light output sections, each of said

15 plurality of laser light output sections including

a semiconductor laser which has a suitable  
operating temperature;

a driving section which supplies a driving  
current to the semiconductor laser;

20 a temperature sensing section which senses  
the temperature of the semiconductor laser;

an electronic temperature control section  
which controls the temperature of the semiconductor  
laser to the suitable operating temperature on the  
25 basis of the temperature sensed by the temperature  
sensing section in a state where at least the  
semiconductor laser is being driven; and

a driving current control section which sets the driving current to an initial value smaller than a steady value at the suitable operating temperature at the start time of the driving of the semiconductor laser and changes the driving current to the steady value as the temperature of the semiconductor laser changes to the suitable operating temperature under the control of the electronic temperature control section.

11. An image display apparatus comprising:

a display section;

a light source section which generates and outputs a plurality of laser beams differing in wavelength; and

a projection section which processes each of said plurality of laser beams on the basis of a video signal and projects the resulting signal onto the display section, wherein

the light source section includes

a plurality of laser light output sections which generate and output the laser beams separately, and

a balance keeping section which maintains constant the intensity balance between the laser beams outputted from the laser light output sections, each of said plurality of laser light output sections including

a semiconductor laser which has a suitable operating temperature;

a driving section which supplies a driving current to the semiconductor laser;

a temperature sensing section which senses the temperature of the semiconductor laser;

an electronic temperature control section which controls the temperature of the semiconductor laser to the suitable operating temperature on the basis of the temperature sensed by the temperature sensing section in a state where at least the semiconductor laser is being driven; and

a driving current control section which sets the driving current to an initial value smaller than a steady value at the suitable operating temperature at the start time of the driving of the semiconductor laser and changes the driving current to the steady value as time elapses since the start time of the driving.

12. The image display apparatus according to claim 10, wherein in each of said plurality of laser light output sections,

the driving current control section determines the initial value according to the temperature sensed by the temperature sensing section at the start time of the driving of the semiconductor laser and changes the driving current according to the temperature sensed by the temperature sensing section, and

the balance keeping section, when the driving current control section makes the driving current of the semiconductor laser lower than the steady value in

at least one of said plurality of laser light output sections, forces the driving currents of the semiconductor lasers of all of the other laser light output sections to decrease.

5        13. The image display apparatus according to claim 10, wherein in each of said plurality of laser light output sections,

         the initial value is a threshold current which causes the semiconductor laser to start laser  
10        oscillation.

         14. The image display apparatus according to claim 11, wherein in each of said plurality of laser light output sections,

         the initial value is a threshold current which causes the semiconductor laser to start laser  
15        oscillation.

         15. A driving control method for a semiconductor laser with a suitable operating temperature, comprising:

20        a driving current setting step of setting a driving current for driving the semiconductor laser to an initial value smaller than a steady value at the suitable operating temperature at the start time of the driving of the semiconductor laser;

25        a temperature control step of controlling the temperature of the semiconductor laser to the suitable operating temperature; and

a driving current changing step of changing the driving current to the steady value as the temperature of the semiconductor laser changes to the suitable operating temperature in the temperature control step.

5           16. A driving control method for a semiconductor laser with a suitable operating temperature, comprising:

          a driving current setting step of setting a driving current for driving the semiconductor laser to  
10       an initial value smaller than a steady value at the suitable operating temperature at the start time of the driving of the semiconductor laser; and

          a driving current changing step of changing the driving current to the steady value as time elapses  
15       since the start time of the driving.

          17. The driving method according to claim 15, further comprising a temperature sensing step of sensing the temperature of the semiconductor laser, wherein

20           the driving current setting step is a step of determining the initial value according to the temperature sensed in the temperature sensing step at the start time of the driving of the semiconductor laser, and

25           the driving current changing step is a step of changing the driving current according to the temperature sensed in the temperature sensing step.



18. The driving method according to claim 15, wherein the driving current setting step sets the initial value as a threshold current which causes the semiconductor laser to start laser oscillation.

5        19. The driving method according to claim 16, wherein the driving current setting step sets the initial value as a threshold current which causes the semiconductor laser to start laser oscillation.